MEASURE **TODAY.** ENSURE **TOMORROW**

# REGAL Series RH20
## Handheld Ultrasonic Flowmeter
Advanced Clamp-on Transit-time Technology for Accurate Flow Measurement

## Applications

The RH20 handheld flowmeter is one of the most powerful yet portable flowmeters on the market. The utilization of our proprietary ultrasonic signal processing, transit-time detection, signal quality tracking, as well as self-adaptation technologies, allows the flowmeter to measure liquid flow rate from outside of a pipe reliably and accurately. Examples of applications include:

- Water, including hot water, chilled water, city water, sea water and more.
- Sewage and drainage water with small particle quantity
- Oil, including crude oil, lubricating oil, diesel oil, fuel oil, etc.
- Chemicals, including alcohol, acids and more.
- Solvents
- Beverage and food processors
- HVAC hot and cool water, water/glycol solutions
- Water and waste treatment
- Power plants (nuclear, thermal & hydropower) heat energy boiler feed water
- Energy consumption supervision and water conservation management
- Metallurgy and mining applications (e.g., acid recovery)
- Marine operation and maintenance
- Pulp and paper
- Pipeline leak detection, inspection, tracking and collection
- Energy measurement and balancing
- Water distribution network monitoring

## Features And Benefits

- Economical tool for bi-directional flow measurement
- Non-intrusive, clamp-on installation, easy and fast
- Signal quality tracking and self-adaptation for robust performance
- Compact design, allowing the main unit to be held and operated with one hand
- Suitable for pure liquids and liquids with some particles. No dependency on conductivity
- Suitable for all commonly used pipes
- Wide pipe size range
- Rechargeable battery for 8 hours of operation
- Self-explanatory user interface. Easy to operate
- Built-in data logger and flow totalizers
- StufManager™ PC software for data download and real-time data acquisition
- USB interface for PC link

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# REGAL Series RH20

## Handheld Ultrasonic Flowmeter

A member of the Regal Series, the RH20 Handheld Ultrasonic Flowmeter is the first member of the 3rd generation ultrasonic flow meters from Spire Metering. Compared with its predecessors, the 3rd generation flowmeters offer better performance and a richer feature set, all at a lower price.

The RH20 handheld flowmeter is carefully designed to be so compact that you are able to use one hand to hold and operate the meter. The user interface is self-explanatory and simple to follow. The unique clamp-on fixture design makes the installation hassle free and no special skills or tools are required.

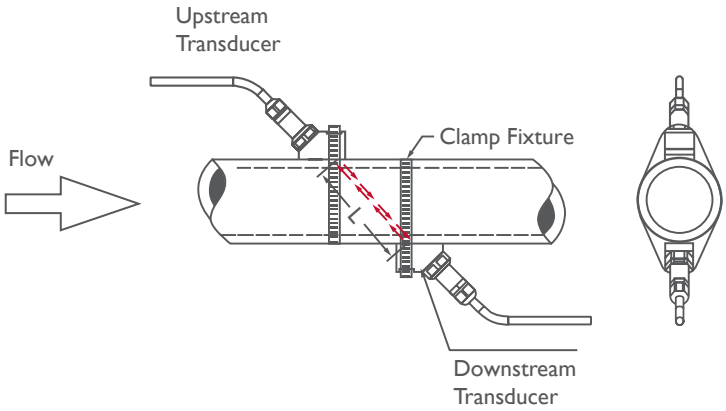
Spire Metering offers the StufManager™ PC software for data logging downloads, as well as exploring the full potential of the RH20 flowmeter.

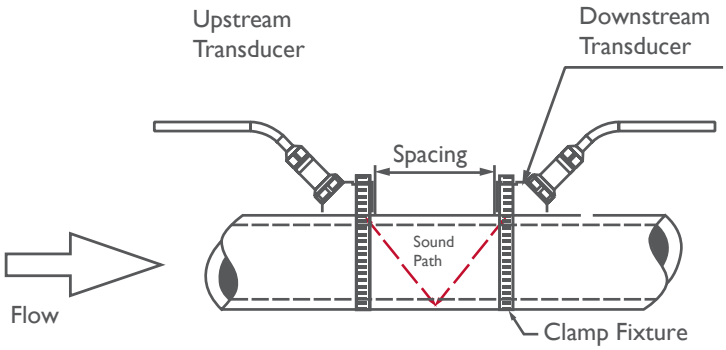
RH20 is the best choice for flow survey, meter verification, pump checking, HVAC balancing, facility management and other demanding flow monitoring applications.

## Measurement Principle

The Regal Series flowmeters are based on the transit-time measurement principle, where the system utilizes a pair of sensors (A and B in figure below) that function as both ultrasonic transmitter and receiver. The sensors are installed on the pipe wall, either clamped on the outside of the pipe or inserted into the pipe at a specific distance from each other. The flow meter operates by alternately transmitting and receiving a coded burst of sound energy between the two sensors and measuring the transit time it takes for sound to travel between the two sensors. The difference in the transit time is directly related to the velocity of the liquid in the pipe. The flowrate is then calculated based on the transit-time difference, the geometry of the pipe and the fluid dynamics formula.

The sensors are commonly mounted with the Z-method or V-method. With the Z-method, the two sensors are installed on opposite sides of a pipe. This method offers a shorter sound path, thus, better signal strength. It is often used for large size pipes where signal strength is more important. With the V-method, the two sensors are installed on the same side of a pipe. The sound path is doubled, thus, the measurement accuracy is better. This method is often used for small and medium size pipes.



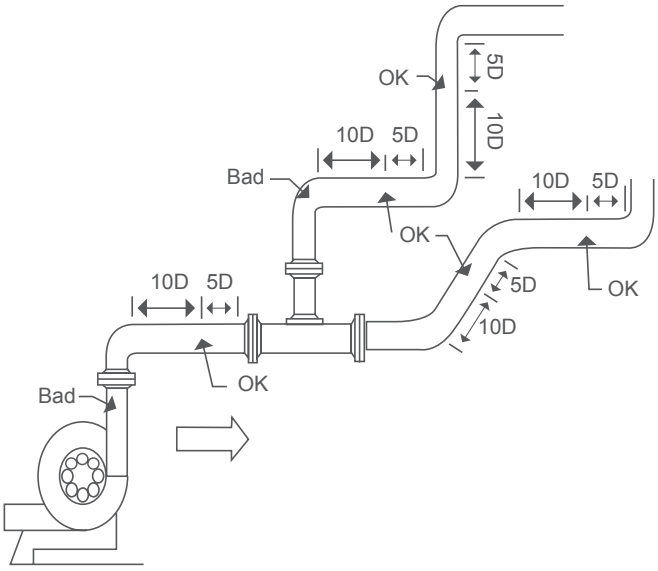



## Typical Transducer Installation

There are several types of transducers you may choose for your application. HS and HM transducers have mounting rails, and are easy to install (figures a and b). You may need a clamping strap to tie the mounting rail to the pipe if the magnet on the rail does not work with the pipe. All the other types of transducers do not have a mounting rail, and are intended to clamp them onto the pipe using the supplied clamping strap (c).

The site of the transducer installation is very important. Here are some recommendations for selecting the correct site:

- In order to achieve good accuracy, it is recommended to have 15D straight-pipe run: upstream 10D and downstream 5D, where D is pipe diameter.
- If there is a valve upstream and the valve is not fully open, it could generate flow disturbance. A longer upstream straight pipe run is recommended.
- If there is a pump upstream, we recommend to have 25D straight pipe run.
- If pipe is vertical, make sure the flow is going upward, not downward. Downward flow could have air gaps if the flow is free fall.
- If pipe is horizontal, make sure the pipe is full and ensure the transducer is installed on the side of the pipe, not on the top or bottom of the pipe.



Installation Site Examples

## Specifications: Flow Transmitter (Main Unit)

| | | |
|---|---|---|
| **Flow Velocity** | ±10 m/s (± 32 ft/s), bi-directional. | |
| **Accuracy** | ±1% of reading ±0.01m/s (±0.03ft/s) in velocity. | |
| **Repeatability** | 0.5% | |
| **Response Time** | 0.5s. Configurable between 0.5s and 99s. | |
| **Display/Keypad** | LCD with backlight, 4 x 16 letters, 4 x 4 tactile-feedback membrane keypad.<br>Displays instantaneous flow rate, flow total (positive, negative and net), velocity, time. | |
| **Units** | English (U.S.) or metric. | |
| **Physical Quantity** | Volumetric flow rate, total flow, velocity. | |
| **Totalizers** | Positive totalizer, negative totalizer, net totalizer, manual totalizer. | |
| **Output** | Optically isolated Open Collector Transistor output (OCT) for frequency and pulse. | |
| **Recording** | Automatically records the daily total of the last 128 days, the monthly total of the last 64 months and the yearly total of the last 5years.<br>Optional SD data logger (2GB space) for recording velocity, flow, status, etc. | |
| **Data Logger** | Built-in data logger can store over 2,000 lines of data. | |
| **Communication Interface** | RS232. Supports the MODBUS protocol. | |
| **Software** | StufManager PC software for data logger download and real-time data acquisition. | |
| **Pipe Size Range** | 1"-120" (DN25mm - DN3,000mm), depending on transducer. | |
| **Pipe Material** | All metals, most plastics, some lined pipes. | |
| **Liquid Type** | Virtually all liquids (full pipe). | |
| **Liquid Temperature** | 32˚F - 176˚F (0˚C - 80˚C) or 32˚F - 312˚F (0˚C - 155˚C), depending on transducer type | |
| **Enclosure** | Handheld Unit | Carrying Case |
| **Protection** | IP54 | Aluminum alloy protective case. Suitable for normal and harsh environment |
| **Dimensions** | 8" x 4" x 1.5" (205mmx103mmx37mm) | 20" x 18" x 6" (508mmx457mmx152mm) |
| **Weight** | 1.2 lbs (538g) with batteries | 16lbs (8kg) (entire package) |
| **Power source** | 3 AAA Ni-H built-in batteries. When fully recharged, it will last over 8 hours of operation.<br>USB power charger. | |

## How To Order

**RH20 -** ☐

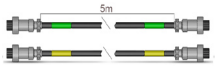
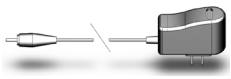
| Thickness Gauge | |
|---|---|
| Yes | Y |
| No | N |

**Example: RH20-Y.**
Standard handheld ultrasonic flowmeter package for pipe sizes from 1" (DN25) to 28" (DN700) with thickness gauge.

**Features include:**

- Main unit (handset)
- HS transducer with mounting rail (magnetic)
- HM transducer with mounting rail (magnetic)
- Transducer cable – 15ft (5m)
- Clamping stretcher
- Couplant
- Battery charger
- USB cable
- Carrying case
- 3-point calibration certificate
- StufManager™ PC Software
- User's manual
- Thickness gauge

## Optional And Replacement Parts

| Model | Picture | Description |
|---|---|---|
| Type: HS<br>PN#: THC-HS | | Small size transducer (mounting rack with magnetic)<br>Dim 7.9"x1"x1" (200x25x25mm3), handle length 3.9" (100mm)<br>For pipe size: 1" - 4" (DN25 - DN100mm)<br>Temperature: 32° F - 176° F (0°C - 80°C) |
| Type: HM<br>PN#: THC-HM | | Medium size transducer (mounting rack with magnetic)<br>Dim 11"x1.6" x1.6" (280x40x40mm3) for each<br>Pipe size: 2" - 28" (DN50 - DN700mm)<br>Temperature: 32° F - 176° F (0°C - 80°C) |
| Type: S1HT<br>PN#: THC-S1HT | | Small size, high temperature transducer<br>Pipe size: 1" - 4" (DN25 - DN100mm)<br>Temperature: 32° F - 312° F (0°C - 155°C) |
| Type: M1HT<br>PN#: THC-M1HT | | Medium size, high temperature transducer<br>Pipe size: 2" - 28" (DN50 - DN700mm)<br>Temperature: 32° F - 312° F (0°C - 155°C) |
| Type: L1<br>PN#: THC-L1 | | Large size transducer<br>Dim 3.1"x2.7" x2.2" (80x70x55mm3)<br>Pipe size: 12" - 120" (DN300 - DN3,000mm)<br>Temperature: 32° F - 176° F (0°C - 80°C) |
| Type: Cable<br>PN#: TH-CBL | | Standard 15' (5m) cable for handheld flowmeter transducer |
| Type: Cable<br>PN#: TH-CBLEX |  | Extension cable, 15' (5m), for handheld flowmeter transducer |
| Type: Thickness Gauge<br>PN#: UT850 | | Thickness gauge for measuring pipe wall thickness on plastic and metal pipes, ranging from pipe size 1" – 120" |
| Type: Battery Pack<br>PN#: HA-BP | | Battery pack |
| Type: Battery Charger<br>PN#: HA-BC |  | Battery charger for handheld flowmeter |
| Type: Carrying Case<br>PN#: HA-CC | | Aluminum carrying case |
| Type: Couplant<br>PN#: TH-CPLT-G | | Lithium grease acoustic couplant |
| Type: Clamp<br>PN#: TH-CLP2 | | Clamping Stretcher for transducer mounting |

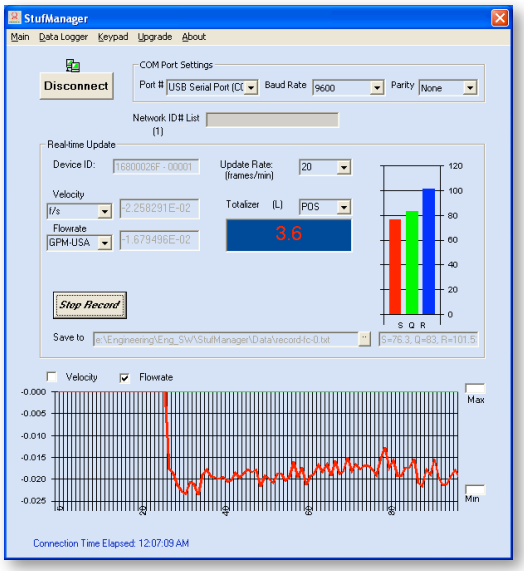
## PC Software

StufManager™ is a Windows-based PC software aimed to facilitate the use of and to explore the full potential of the RH20 handheld flowmeter.

StufManager™ software makes it very easy to connect a RH20 device to a PC through USB connection. The software automatically detects the virtue COM port used by the USB port and talks to the flowmeter with minimum human interaction. For these users with limited technical expertise, this software is essential as its ease of use saves both time and money.

With StufManager™ software, you can download data from the data logger inside the flowmeter directly to your computer. You can also format the downloaded raw data into standard formats with a simple click of the mouse. You may then save the data to your computer hard drive and use Excel or other spreadsheet software to manipulate the data at later point.

StufManager™ software allows you to acquire the flowmeter data in real-time and display the data on a graphical interface. You can save the real-time data to your computer easily.




## About Spire Metering Technology

Formerly Shenitech, Spire Metering is a global leader in flow and energy management solutions. Through continuous innovation, we transform complex ultrasonic technology into affordable, reliable solutions for accurate flow and energy measurement. Spire Metering offers water, heat, electricity and gas meters as well as AMR/AMI solutions. To find out how we can help today, please tell us about your application.